



ETSI Project

***Broadband Radio Access Networks
(BRAN)***

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VISION



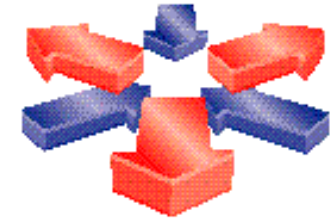
***Broadband Access Technology
at commodity prices
by 2002***



ETSI Project BRAN

BRAN got underway in April 1997

- **to subsume work of RES10 and TM4 on broadband access (TM4 continues its work on conventional RLL)**
- **to develop standards for high quality radio fixed access networks**
- **to produce specifications for HIPERLANs**
- **to exploit the commonality between these systems**



The Requirement

- **Broadband radio access networks**
 - *support different applications*
 - *service different core networks*
 - *operate in different frequency bands*
- ***But all variations***
 - **must be low cost**
 - **must offer high bit rates**
 - **must provide managed QoS**



The solution

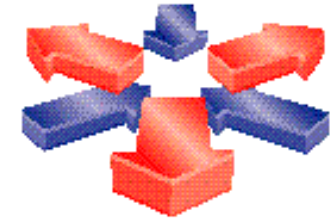
Radio packet networks that:

- **support ATM, IP, RSVP, etc.**
- **flexible**
 - *in range: 50 - 5000 m*
 - *instantaneous data rate: 25 Mb/s with fallback and upgrade options*
 - *frequency: 2 / 3 / 5 / 10 / 17 / 28 / 40 / 60 GHz*
- **core network independent:**
 - *allow same core networks as mobile systems*



Network Types - 1

- **HIPERLAN/2**
 - *operating at 25 Mbit/s in 5 GHz band*
 - *providing short range and cordless services*
 - *indoor and campus-wide usage with a typical indoor coverage of 50 m and outdoor 150 m*
 - *wireless access and WLAN applications*
 - *license-exempt*
 - *supporting user mobility within local service area*



Network Types - 2

- **HIPERACCESS**

- *operating at 25 Mbit/s*
- *providing long range and fixed radio connections to customer premises*
- *outdoor usage for residential and small to medium-sized business applications with a coverage of up to 5 km*
- *wireless access to private networks and public operators (urban and rural)*
- *mainly licensed, but also licence-exempt (5GHz?)*

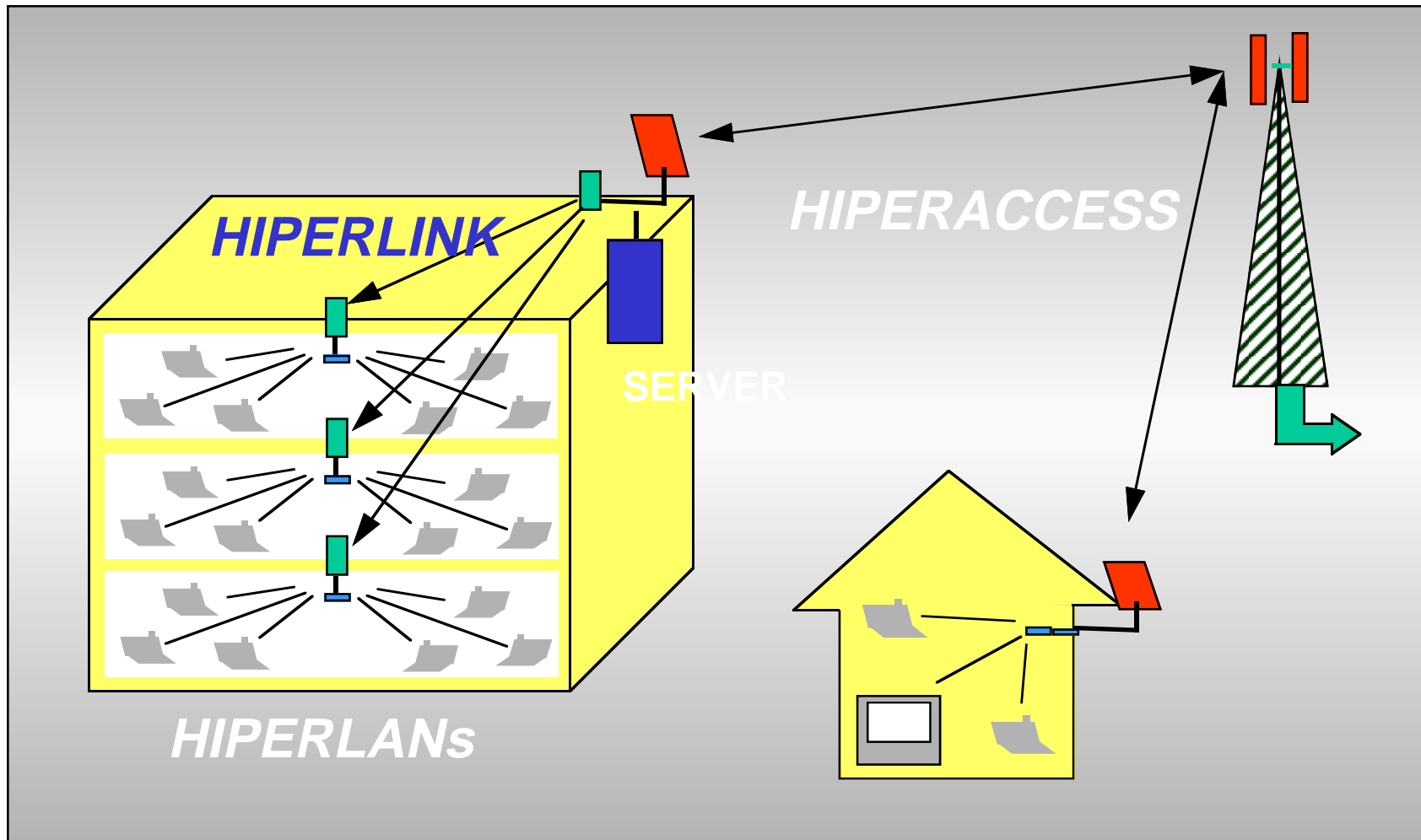


Network Types - 3

- **HIPERLINK - 155 Mb/s**
 - ***interconnect HIPERACCESS & HIPERLAN***
 - ***licence exempt***



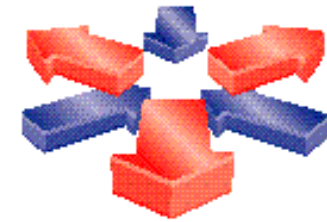
Broadband Radio Networks



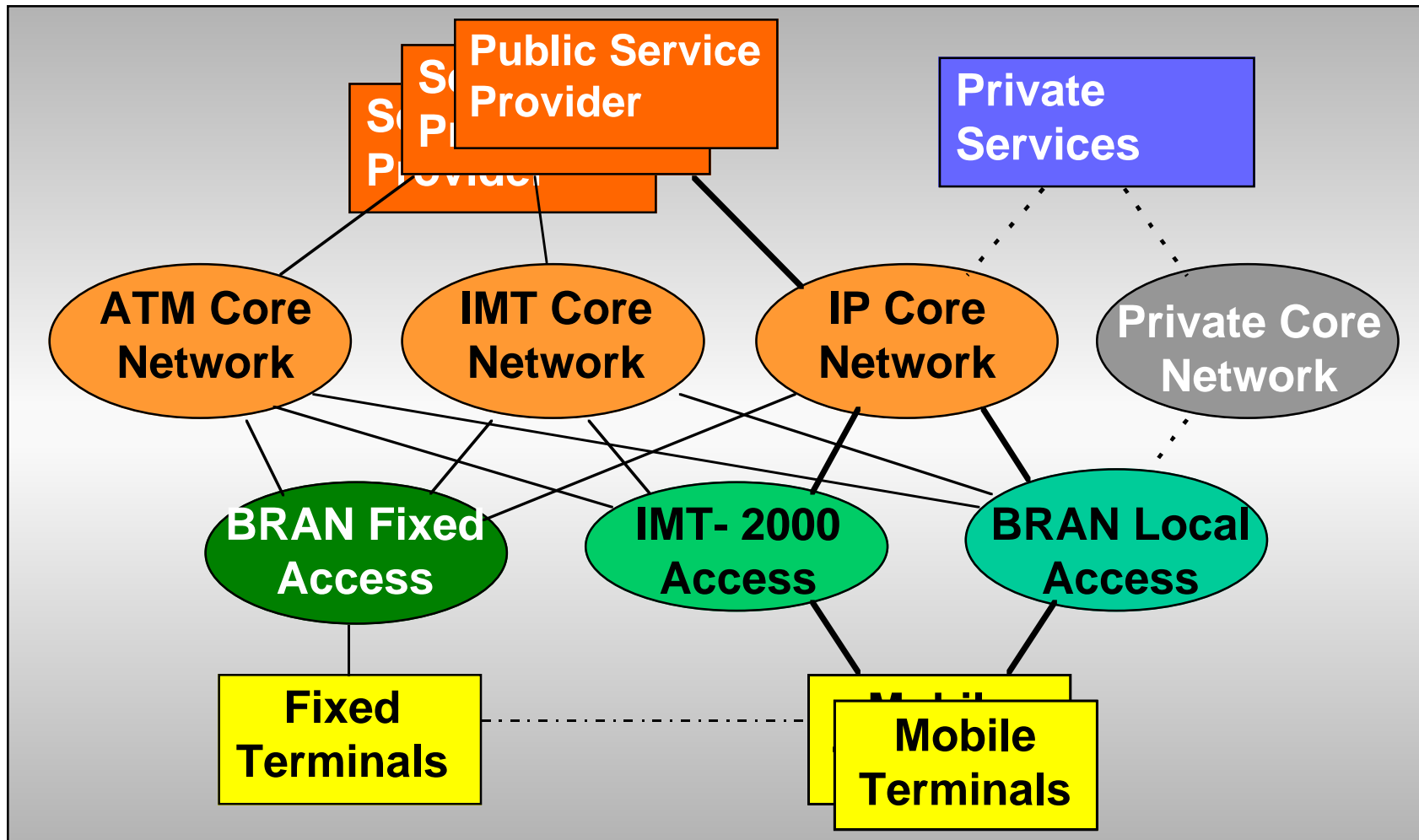


The big picture

- **IMT-2000 Convergence**
 - *trend in IMT-2000 towards “GRAN view”*
 - *multiple radio platforms for delivering future services to mobile, cordless and fixed access users*
 - *common access interface is desirable - allows user to access the same services through different access networks.*
- **BRAN can complement “mobile”**
- **Co-operation with ETSI SMG12 is under way**

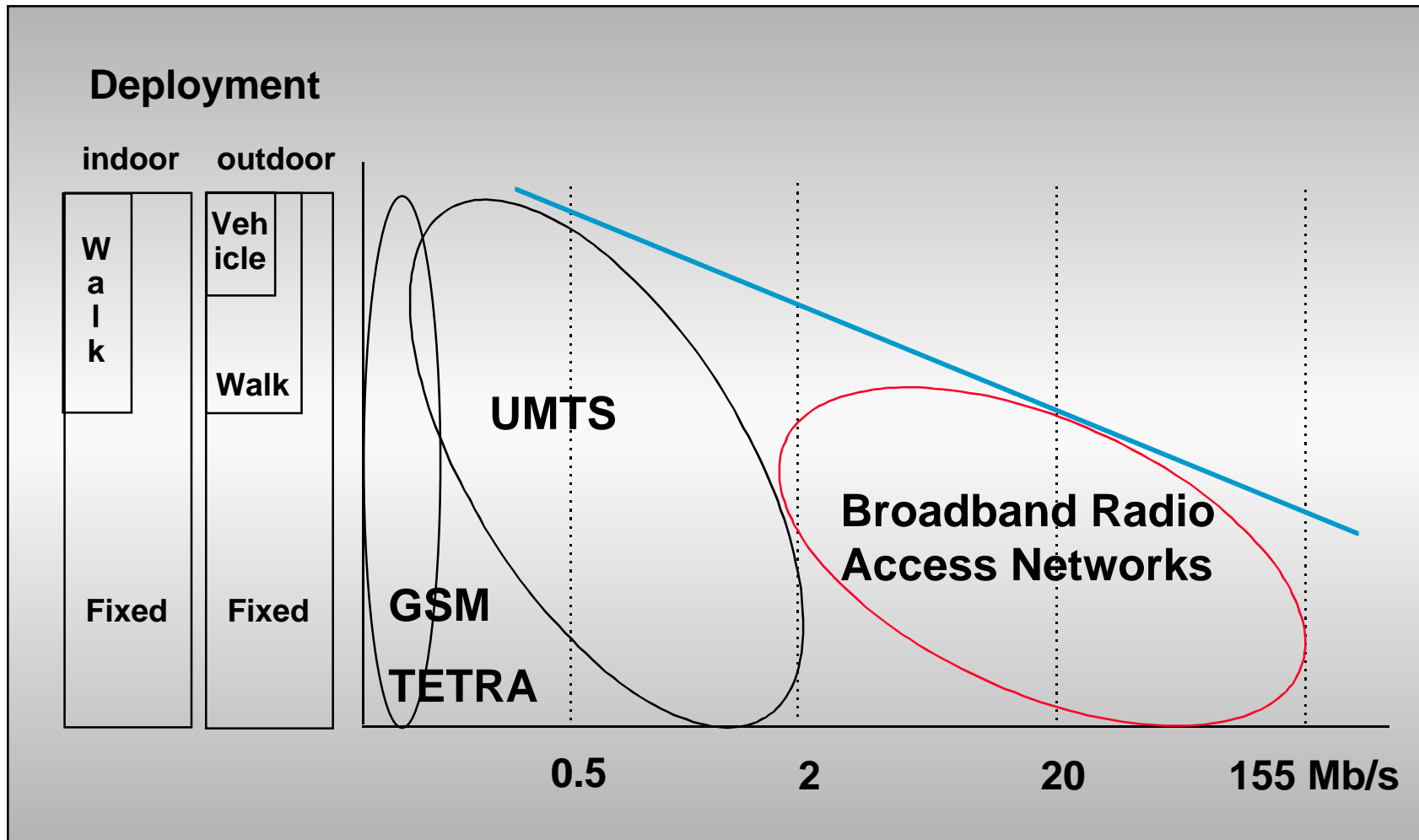


The new access environment





Relationship to “Mobile”





Spectrum Issues

- **HIPERACCESS**

- ***Large amount of spectrum needed***
 - *depends on market penetration*
 - *technology will reduce this over time*
- ***Ideal frequency varies with user density***
 - *range varies inversely with frequency*
- ***Fixed Links are being replaced by fibre etc.***
 - *releases new frequencies*
 - *spectrum is being re-allocated*
- ***BRAN is working with ERO, ITU-R, CEPT FM29, etc.***



Spectrum Issues

- **HIPERLANs:**
 - ***CEPT has allocated 150 MHz in the 5 GHz band***
 - *5150 - 5300 MHz*
 - *extension being studied in CEPT/SE24*
 - *for a total of 330 MHz*
 - *5150 - 5250 MHz also used by MSS feeder links*
 - *Globalstar, ICO12*
 - ***US has allocated 300 MHz in the 5 GHz band***
 - *5150 - 5350 and 5725 - 5825 MHz*
 - *FSS uses 5750 - 5850 MHz, uplink of Telecom 3 (Fr)*
 - ***MSS and FSS claim unacceptable interference***
 - *technical assessment in progress in CEPT and ITU-R*

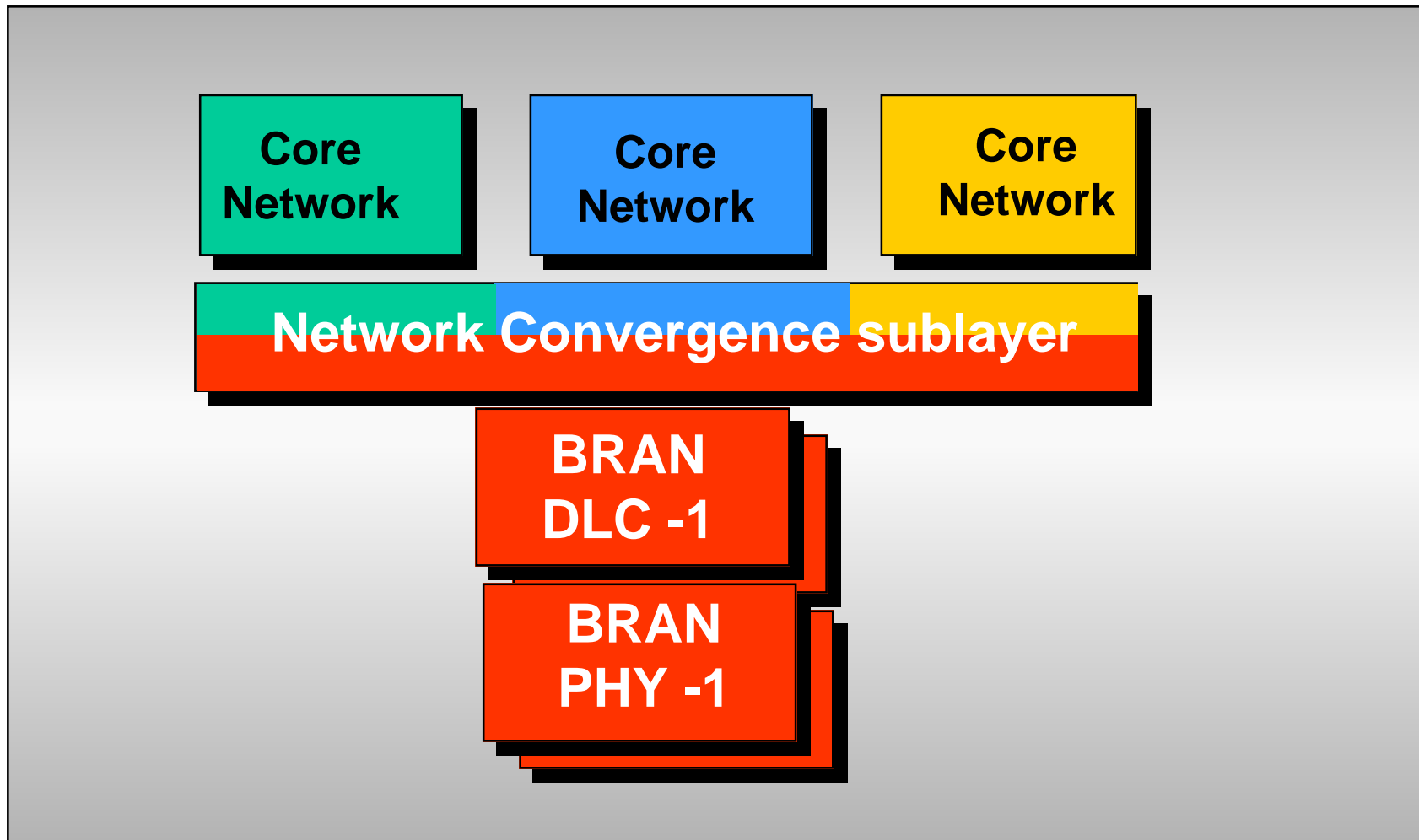


Deliverables

- **Specifications for radio subsystems (interoperability / co-existence)**
 - *Radio Physical layer*
 - *Radio Data Link Control layer*
 - *Radio Network Management functions*
- **Specifications for interworking**
 - *convergence sublayers for core networks*
- **Specifications for regulatory and conformance testing**

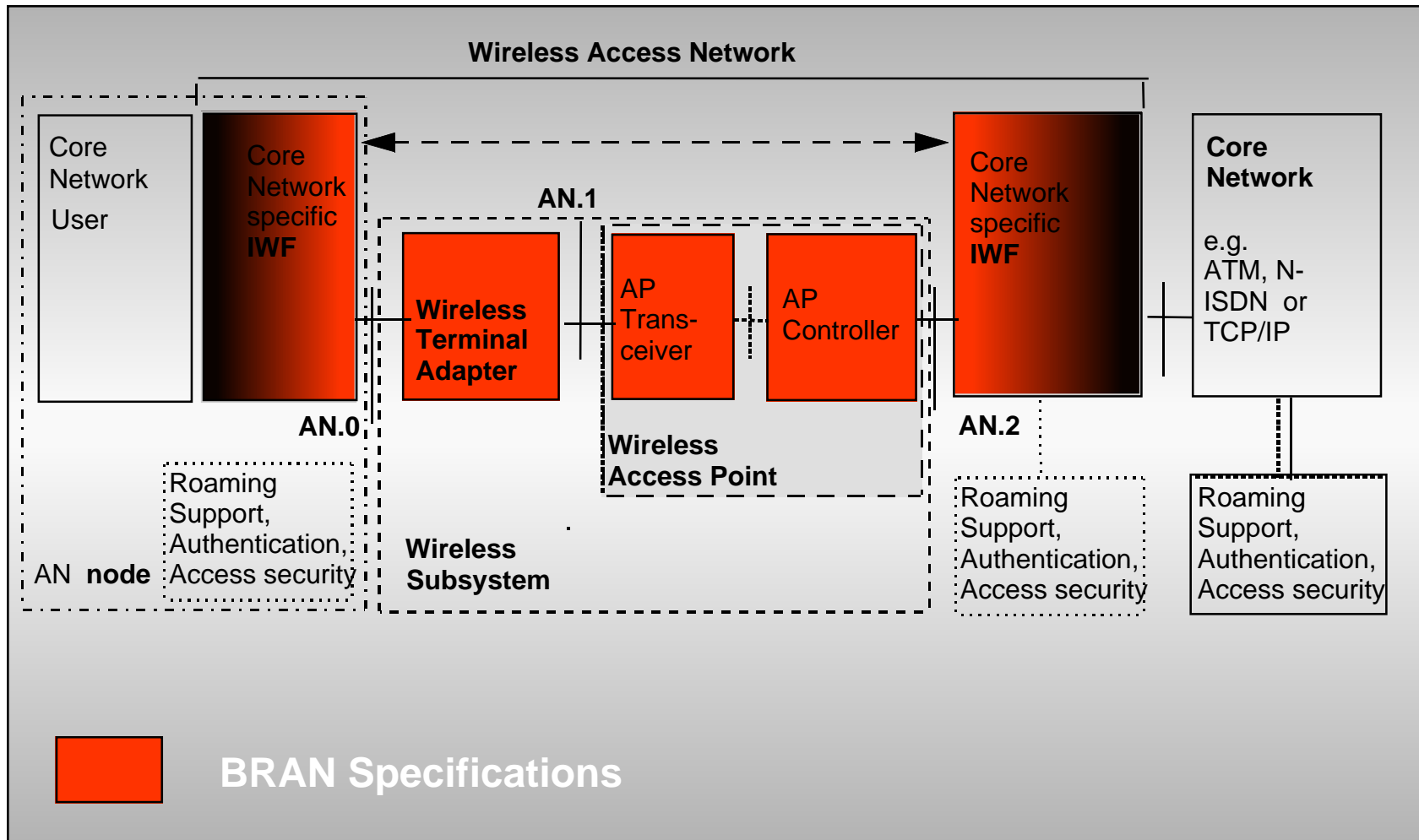


Basic Interworking Approach





Reference Model





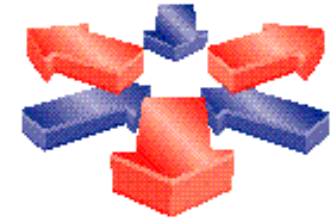
Key Liaison Activities

- **In support of a world-wide standard**
 - ***IEEE 802.11 - common PHY specification***
 - *agreed target at last meeting*
 - *no obvious roadblocks to agreement on essentials*
 - *subsetting to satisfy particular needs*
 - *joint timing of decision making is needed to avoid “dictate” by either*
 - ***MMAC - common PHY and DLC/Interworking***
- **In support of future-proof scope**
 - ***SMG-12 - UMTS Interworking***
 - ***ATM Forum on wireless (mobile) ATM***



Organization

- **Rapporteur groups for deliverables**
-
- **Area Co-ordinators for HIPERLAN, HIPERACCES, Regulations and Spectrum**
-
- **Project Management Committee to assure consistency**



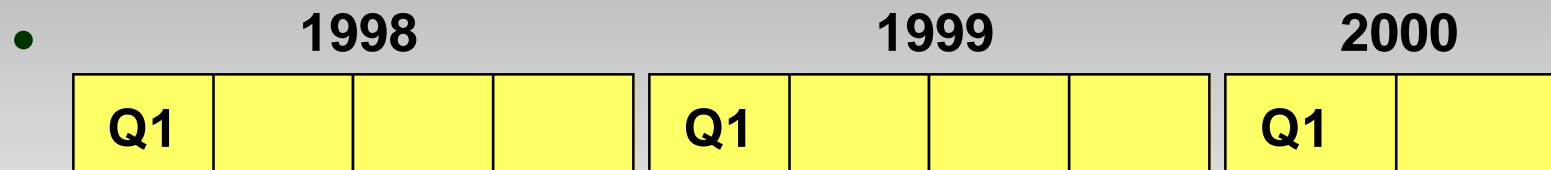
Schedule - 1

- **Driven by**
 - *competition, e.g. from two-way cable, xDSL, satellites*
 - *market demand - video on demand, wireless Internet access, etc.*
- **Limited by**
 - *Time needed to lay the groundwork*
 - *Project resources*
- **First standards by mid 1999**
- **Standards completed by 2002**



Schedule - 2

- **Planning**



HIPERLAN/2

Functional Specifications

Test Specifications

HIPERACCESS

Functional Specifications

Test Specifications



Current Status - 1

- **First Technical Reports finished/approved**
 - ***HIPERLAN/2 - Requirements and Architecture***
 - *applications, operational requirements, performance, etc.*
 - ***HIPERACCESS - Requirements and Architecture***
 - ***Broadband Radio Technologies and Techniques***
 - *inputs from WAND, SAMBA, AWACS, ATMmobil*
 - ***HIPERLAN/2 System Overview***
 - ***ETSI - ATM Forum Common Reference Model***
 - *needed to align work between these fora*
 - *ETSI: radio connection and hand-over*
 - *ATM Forum: signaling for connection and hand-over*



Current Status - 2

- **Work in progress**
 - ***HIPERACCESS System Overview***
 - ***HIPERACCESS spectrum analysis***
 - *how much spectrum for rural, urban, etc.*
 - ***Basic PHY model based on OFDM for HIPERLAN/2***
 - *flexible enough to support many applications*
 - ***Basic DLC model based on slotted dynamic TDMA frames***
 - *good support for QoS*
 - ***Interworking model for IP, ATM and UMTS***
 - *IP as test case*

ETSI



further information:

<http://www.etsi.fr/bran>

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